

FORMING CARBON NANOTUBES AT LOWER TEMPERATURES SUITABLE
FOR ELECTRON-EMITTING DEVICE, AND ASSOCIATED
FABRICATION METHOD

5 ABSTRACT

 An electron-emitting device contains a vertical
emitter electrode patterned into multiple laterally
separated sections situated between the electron-
emissive elements, on one hand, and a substrate, on the
10 other hand. The electron-emissive elements comprising
carbon nanotubes are grown at a temperature range of
300°C to 500°C compatible with the thermal stress of
the underlying substrate. The electron-emissive
elements are grown on a granularized catalyst layer that
15 provides a large surface area for growing the electron-
emissive elements at such low temperature ranges. To
ensure growth uniformity of the carbon nanotubes, the
granularized substrate is soaked in a pre-growth plasma
gas to enhance the surface diffusion properties of the
20 granularized substrate for carbon diffusion.